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EXAMINER

KOLLIAS, ALEXANDER C

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,272	Applicant(s) LUCINI, OSCAR	
	Examiner ALEXANDER C. KOLLIAS	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41-80 is/are pending in the application.
- 4a) Of the above claim(s) 61-75 and 77-80 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41-60 and 76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20060426</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. Applicant's election with traverse of Group I in the reply filed on 7/6/2009 is acknowledged. The traversal is on the ground(s) that the previous Office Action did not establish lack of unity of the three groups set forth in the restriction requirement mail on 3/4/2009. Specifically, Applicant argues that Yasuda et al disclose or suggest a solution of at least one silicate of an alkaline metal. However, attention is drawn to Motoki (US 4,802,921) which discloses a binder resin compositions comprising aqueous solution of potassium silicate, silica and hardening agents.

The requirement is still deemed proper and is therefore made FINAL.

2. It is noted that the Office Action mailed on 3/4/2009 set forth claim 77 in Group I and claim 76 in Group III. However, it is noted that this was an inadvertent typographical error, the claims of Group should have instead been set forth as 41-60 and 76 and Group II claims 77-80.

3. Claims 61-75, and 77-80 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction requirement in the reply filed on 7/6/2009.

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Specification

4. The use of the trademarks DUPLAS, PHENIL, AND SOLUMEX have been noted in this application. they should be capitalized wherever they appear and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 41-60 and 76 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 41-60 and 76 recite the phrase “binding resin”. The phrase “resin” renders the scope of the claim indefinite given that a resin is a semisolid or solid complex amorphous mix of organic compounds”. However not such component is recite in the present claims. Clarification is requested.

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8. Claim 41 recites the phrase "a binding resin particularly for manufacturing articles". The phrase "particularly" renders the scope of the claim indefinite given that it is not clear if the "binding resin" must be utilized for manufacturing articles or can be applied to other items.

9. Claim 42 recites for component (D) "a powder comprising at least one pozzolanic inorganic binding agent with a large specific surface area". The phrase "large specific surface area" renders the scope indefinite given that it is not clear what Applicant's definition of "large specific surface area" is. Is it for example $10 \text{ m}^2/\text{g}$, $15 \text{ m}^2/\text{g}$, etc?

10. Claim 43 recites for component (D) "a powder comprising at least one pozzolanic inorganic binding agent with a large specific surface area". The phrase "large specific surface area" renders the scope indefinite given that it is not clear what Applicant's definition of "large specific surface area" is. Is it for example $10 \text{ m}^2/\text{g}$, $15 \text{ m}^2/\text{g}$, etc?

11. Claim 46 recites for component (D) "a powder comprising at least one pozzolanic inorganic binding agent with a large specific surface area". The phrase "large specific surface area" renders the scope indefinite given that it is not clear what Applicant's definition of "large specific surface area" is. Is it for example $10 \text{ m}^2/\text{g}$, $15 \text{ m}^2/\text{g}$, etc?

12. Claim 43 recites the binding resin according to claim 41, further comprising at least one element for each of the following groups", i.e. Group (1) – Group (5). However claim 41 recites a binding resin comprising (A) a powder that comprises silica and one or more hardening agents

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and (B) a solution of at least one silicate of an alkaline metal. Given that claim 41 recites in Group (1) and Group (2) the components A and B recited in claim 43, it is not clear if components (A) and (B) of claim 43 are additional silica/hardening agents and solutions or if (A) and (B) in claim 43 are the same constituents recited in claim 42.

13. Claim 44 recites “the binder resin according to claim 42, further comprising all the ingredients (A) to (G)”. The phrase “further comprising” recited in claim 44 renders the scope of the claim indefinite given that claim 42 already requires components (A) and (B) with components (C)-(G) being optional. Thus, it is not clear if components (A)-(B) in claim 44 are the same components (A)-(B) recited in claim 42 or additional components. Given that (A) and (B) are required in claim 42 and (C)-(G) are optional, it is suggested that claim 44 be re-written as “the binding resin according to claim 42, comprising (A) to (G). Appropriate correction is required.

14. Claim 45 recites the limitations “the final weight” and “the mixture” in Lines 4-5 and Lines 6-7. There is insufficient antecedent basis for this limitation in the claim.

15. Claim 46 recites the limitations “the final weight” and “the mixture” in Lines 4-5, Lines 7-8, Line 10, Line 12-13, Lines 15-16. There is insufficient antecedent basis for this limitation in the claim.

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16. Claim 47 recites the limitation "the total" in Lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

17. Claim 51 recites the limitation "the aqueous solution of alkaline metal silicate in Lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

18. Claim 53 recites the limitation "the source material" in Line 5. There is insufficient antecedent basis for this limitation in the claim.

19. Claim 53 recites the limitation "the slag" in Line 5. There is insufficient antecedent basis for this limitation in the claim.

20. Claim 53 recites the limitation "the quantities" in Line 4. There is insufficient antecedent basis for this limitation in the claim.

21. Claim 53 recites that the furnace slag comprises "calcium oxide in an amount of approximately 40 % weight, silica in an amount of approximately 43 % weight, and alumina an amount of approximately 10 % weight, the quantities being variable according to the source material from which the slag is derived. It is noted that (a) the phrase "approximately" renders the scope of the claim indefinite given that it not clear what is encompassed by "approximately". Is it for example for calcium oxides 39 %, 43 %, etc? (b) the phrase "the quantities being variable according to the source material from which the slag is derived" further renders the

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scope of the claim indefinite given that it is not clear how variable the quantities of the calcium oxides, silica and alumina may be depending on the source material.

22. Claim 54 recites the binder resin according to claim 42 wherein component (D) is constituted by condensed silica fume. The phrase "constituted" renders the scope of the claim indefinite. Claim 42 for component (D) is open to the inclusion of other ingredients in component (D) (c.f. the phrase "comprising"), i.e. "a powder comprising at least one pozzolanic binding agents with large specific surface area". However claim 54 recites that (D) is "constituted by", thus it is not clear if the phrase "constituted by" is open to the inclusion of other ingredients for component (D) or limits component (D) to condensed silica fume.

23. Claim 55 recites that the condensed silica fume is an amorphous power. The phrase "amorphous powder" renders the scope of the claim confusing, given that either (a) the phrase "amorphous" as applied to power is redundant given that powers as a whole do not have a defined shape or (b) Applicant's intention is claim condensed silica fume where the silica is amorphous. Clarification requested.

24. Claim 56 recites "the binder resin according to claim 42 wherein the waterproofer in component (E) is constituted by a solution of at least one alkylsiliconate". The phrase "constituted" renders the scope of the claim indefinite. Claim 42 for component (E) is open to the inclusion of other ingredients in component (D) (c.f. the phrase "comprising"), i.e. "a solution comprising at least one waterproofer". However claim 56 recites that (E) is "constituted

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by”, thus it is not clear if the phrase “constituted by” is open to the inclusion of other ingredients for component (E) or limits component (D) to a solution of at least one alkylsiliconate.

25. Claim 46 recites the limitations "the total weight" and “the mixture” in Line 3. There is insufficient antecedent basis for this limitation in the claim.

26. Claim 60 recites the binder resin according to claim 42 wherein the solid water-repellent agent in ingredient (G) is constituted by at least one alkyl alkoxysilane”. The phrase "constituted" renders the scope of the claim indefinite. Claim 42 for component (G) is open to the inclusion of other ingredients in component (D) (c.f. the phrase “comprising”), i.e. "a powder comprising at least one water-repellent agent in solid form”. However claim 42 recites that (G) is “constituted by”, thus it is not clear if the phrase “constituted by” is open to the inclusion of other ingredients for component (g) or limits component (G) to at least one alkylsiliconate.

Claim Objections

27. Claim 45 is objected to because of the following informalities: Claim 45 in Lines 3-4 recites "in an amount comprised between 15 and 85 % by weight”. It is suggested that this phrase be rewritten as follows: "in an amount between 15 and 85 % by weight”. Appropriate correction is required.

28. Claim 46 is objected to because of the following informalities: Claim 46 in Line 4 recites "in an amount comprised between 4 and 10 % by weight”. It is suggested that this phrase be

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rewritten as follows: "in an amount between 4 and 10 % by weight". Appropriate correction is required.

29. Claim 46 is objected to because of the following informalities: Claim 46 in Line 7 recites "in an amount comprised between 5 and 15 % by weight". It is suggested that this phrase be rewritten as follows: "in an amount between 5 and 15 % by weight". Appropriate correction is required.

30. Claim 46 is objected to because of the following informalities: Claim 46 in Lines 9-10 recites "in an amount comprised between 1 and 2 % by weight". It is suggested that this phrase be rewritten as follows: "in an amount between 1 and 2 % by weight". Appropriate correction is required.

31. Claim 46 is objected to because of the following informalities: Claim 46 in Line 12 recites "in an amount comprised between 5 and 40 % by weight". It is suggested that this phrase be rewritten as follows: "in an amount between 5 and 40 % by weight". Appropriate correction is required.

32. Claim 46 is objected to because of the following informalities: Claim 46 in Line 15 recites "in an amount comprised between 0.1 and 1 % by weight". It is suggested that this phrase be rewritten as follows: "in an amount between 0.1 and 1 % by weight". Appropriate correction is required.

33. Claim 47 is objected to because of the following informalities: Claim 47 in Line 3 recites "in an amount comprised between 0.1 and 20 % by weight". It is suggested that this phrase be rewritten as follows: "in an amount between 0.1 and 20 % by weight". Appropriate correction is required.

34. Claim 48 recites that the "hardening agent is selected from the group that comprises polyhydroxyl alcohol ester and alkylene carbonate esters". The phrase "selected from the group that comprises" is improper Markush language. It is suggested that claim 48 be rewritten as follows: "hardening agent is selected from the group consisting of polyhydroxyl alcohol ester and alkylene carbonate esters"

35. Claim 50 recites that the "alkaline metal is selected from the group that comprises sodium, potassium and a mixture thereof". The phrase "selected from the group that comprises" is improper Markush language. It is suggested that claim 48 be rewritten as follows: "hardening agent is selected from the group consisting of polyhydroxyl alcohol ester and alkylene carbonate esters".

36. Claim 51 is objected to because of the following informalities: Claim 51 in Lines 3 and 4 recites "comprised between 1.5:1 and 4.0:1". It is suggested that this phrase be rewritten as follows: "between 1.5:1 and 4.0:1". Appropriate correction is required.

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37. Claim 55 is objected to because of the following informalities: Claim 55 in Line 3 recites "a bulk density comprised in the range of 0.6 +/- 0.02 kg/l". It is suggested that this phrase be rewritten as follows: "a bulk density in the range of 0.6 +/- 0.02 kg/l". Appropriate correction is required.

38. Claim 55 is objected to because of the following informalities: Claim 55 in Lines 3-4 recites "a specific surface area equal to, or greater than, 15 m²/g". It is suggested that this phrase be rewritten as follows: "a specific surface area equal to or greater than 15 m²/g". Appropriate correction is required.

39. Claim 58 is objected to because of the following informalities: Claim 58 in Lines 2-3 recites "alkylsiliconate is present in amount comprised between 1 and 3 % by weight". It is suggested that this phrase be rewritten as follows: "alkylsiliconate is present in amount between 1 and 3 % by weight". Appropriate correction is required.

Claim Rejections - 35 USC § 102

40. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

41. Claims 41, 45, 49-50, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Motoki (US 4,802,921).

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Regarding claim 41, 49-50, and 76, Motoki discloses a composition for refractory coatings comprising water-soluble alkali metal silicates and hardening agents for the silicates (Abstract, Column 2, Lines 39-47). Specific attention is drawn to Col. 9, Table 1-A Example 9 which discloses a composition comprising an aqueous solution of potassium silicate (denoted as ingredient A-1), alumina cement having the composition $\text{Al}_2\text{O}_3/\text{CaO}$ (denoted as B-1), and Portland cement having the compositions CaO/SiO_2 (denoted as B-2), see Tables disclosed in Cols. 7-8 for component notation. It is noted that component A-1 meets the limitation drawn to a solution of a silicate of an alkaline metal recited the present claims and an aqueous solution recited in claim 49. Further, it is noted that the alkaline metal discussed above is potassium, thus meeting the limitations recited in claim 50.

Regarding the disclosed alumina and Portland cements, it is noted that: (a) Portland cement comprises SiO_2 , thus meeting the limitation for ingredient (A), i.e. a silica, (b) Column 3 Lines 55-58 disclose hardening agents such as alumina and Portland cements and (c) Col. 9 Lines 40-57 disclose a process for making the composition, where the ingredients, i.e. B-1, B-2 as well as other dry ingredients are mixed to obtain a powder mixture. Based on the above, it clear that the composition in Example 9 comprises a powder that comprises silica and one or more hardening agents as presently claimed. Finally, it is noted given that the reference discloses a composition comprising the ingredients as presently claimed, that the composition disclosed by the reference is a resin binder; while Col. 9 Lines 40-56 discloses a product manufactured from the disclosed composition, meet the limitations of claim 76.

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Regarding claim 45, Motoki teaches all the claim limitations as set forth above. Additionally, it is noted that in Example 9 discussed above, the alkali silicate (A-1) comprises 10 Kg, silica and hardening agent (components B-1 and B-2) comprise 3 and 0.5 kg, respectively, while component C-1, a water releasing agent, and D-2, a foaming agent, comprise 14 and 0.2 Kg, respectively. From the components above, the total weight of the compositions is determined to be 17.7 kg, where the alkaline silicate solution and silica/hardening agent comprise 56.5 wt % and 19.8 wt % of the final mixture. It is noted that the amounts disclosed by the reference are within the amounts of 15 to 85 wt % for (A) and 85 to 15 wt % for (B) of the total mixture recited in the present claims.

In light of the above, it is clear that Motoki anticipates the presently recited claims.

42. Claims 41, 47-51, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Barrier (US 4,363,665).

Regarding claims 41, 48-50 and 76, Barrier et al discloses compositions comprising sand, an alkali metal silicate and a hardening agent (Abstract, Column 2, Lines 29-42). Specific attention is drawn to Example 1 and Example 4 (Column 4, Lines 53-68 and Column 6) which disclose a composition comprising an aqueous solution of sodium silicate, and silica sand (Column 3, Lines 50-68 and Column 4 Lines 1-10) and hardening agents, i.e., methyl esters of adipic, glutaric and succinic acids in Example 1 and di- and triacetin, i.e. alkylene carbonate esters of claim 48 in Example 4. From Example 1, it is clear that the reference discloses a powder comprising silica and the hardening agents. Further it is noted that the aqueous alkaline metal solution disclosed by the reference meets the limitations recited in claims 49-50. Further, it

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is noted that the reference discloses articles produced start from a bind resin as recited in claim 76.

Regarding claim 47, Barrier discloses all the claim limitations as set forth above. Additionally, it is noted that in Example 1 discussed above, the reference discloses that the composition comprises 1 kg (1,000 g) silica sand, 0.5 wt % of a hardener comprising 20 % diethylene glycol solvent and 80 % of a mixture of methyl esters of adipic, glutaric, and succinic acids as hardeners, 3.5 % sodium silicate, and 1.8 wt % of a demolding agent (Column 3, Lines 11-28). Based on the amount of sand 1,000 g, it is determined that the composition comprises 18 g of the demolding agent, 35 g of sodium silica, 4 g hardener and 1 g solvent, for a total of 1058 g. From the total weight of the powder, silica, hardener, and solvent comprise 1005 g, with silica and hardeners comprising 99.5 wt. % and 0.39 wt. % of the composition respectively. It is noted that the amount of are with the range of 10 to 99.9 wt. % and 0.1 to 20 wt. % as recited in claim 47.

Regarding claim 51, Barrier discloses all the claim limitations as set forth above. Additionally, it is noted that the alkali metal silicate disclosed in Example 1 of the reference has a weight ratio of SiO_2 to Na_2O of 2.39 : 1 (Column 3, Lines 63-68). It is noted that the ratio disclosed by the reference is within the range of 1.5-4.0 : 1 recited in the present claim.

In light of the above, it is clear that Barrier anticipates the presently recited claims.

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43. Claims 41-42, 54, 56-57, 59-60, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawai et al (US 5,945,044) as evidenced by Anderson et al (US 5,695,811), Cornwell et al (US 4,310,486), and Japs (US 4,099,376).

Regarding claims 41-42, 54, 56-57, 59-60, and 76, Kawai et al discloses a cement composition comprising silica cement comprising silica containing silica materials such as volcanic ash, silica fume, and silica sand, hardeners such as calcium sulfate, and alumina, as well as solutions comprising alkaline met a silicates (Column 2 Lines 18-24, Column 3, Lines 17-20). It is clear that the composition disclosed by the reference is a binding resin as presently claimed. Additionally, the reference discloses articles manufactured from the composition, meet the limitations of claim 76. (Column 3, Lines 22-33).

It is noted that the siliceous cement disclosed by the reference includes silica fume. Although the reference does not discloses that silica fume is a pozzolanic binding agent with a large surface area, it is the Examiner's position that silica fume meets these limitations recited for ingredient (D) of claim 42. Evidence supporting the Examiner's position is found in Col. 2 Lines 29-34 of Japs which discloses that silica fume has a large surface area while Col. 1 Lines 25-28 of Cornwell et al discloses the silica fume is a pozzolanic binding agent.

Regarding claim 54, although the Kawai does not discloses that silica is condensed silica fume as recited in claim 54, it is the Examiner's position that "silica fume" is "condensed silica fume". Evidence support the Examiner's position is found on Col. 15 Lines 47-48 of Anderson et al which discloses that silica fume, is also known as micro-silica or condensed silica fume. Thus, it is clear that the silica fume disclosed by Kawai meets the condensed silica fume recited in claim 54. Regarding claims 56-57 and 59-60, it is noted that (a) these claims ultimately

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depend from claim 42 from which the water-proofing agent solution and water-repellant agent in solid form are optional and (b) these ingredients remain optional in claims 56-57 and 59-60 and therefore not required.

In light of the above, it is clear that Kawai et al as evidenced by Anderson, Cornwall and Japs anticipates the presently recited claims.

44. Claim 55 is rejected under 35 U.S.C. 102(b) as being anticipated by Kawai et al (US 5,945,044) as evidenced by Anderson et al (US 5,695,811), Cornwall et al (US 4,310,486), Japs (US 4,099,376), Lane et al (US 5,028,267), and Scheetz et al (US 4,505,753).

The discussion with respect to Kawai et al, Anderson, Cornwall and Japs as set forth in Paragraph 43 above is incorporated here by reference.

Regarding claim 55, the combined disclosures of et al, Anderson, Cornwall and Japs teach all the claim limitations as set forth above. As discussed above, Kawai discloses silica fume while Anderson discloses that silica fume is also commonly known as micro-silica or condensed silica. However, Kawai does not disclose that the silica fume has a bulk density in the range of 0.60 +/- 0.02 kg/L and a specific surface area equal to or greater than 15 m²/g, it is the Examiner's position that silica fume intrinsically possess the presently claimed bulk density and surface are recited in the present claims. Evidence supporting the Examiner's position is found in Col. 2 Lines 20-24 of Lane which discloses that silica fume or micro-silica typically has a BET surface area of approximately 20 m²/g, and a tamped, i.e. densified, bulk density of 0.6 kg/L (600 g/L).

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While Kawai discloses silica fume, i.e. condensed silica fume, the reference does not disclose that the condensed silica fume is an amorphous powder with spheroidal granules, it is the Examiner's position that condensed silica fume is inherently an amorphous powder with spheroidal particles. Evidence supporting the Examiner's position is found in Col. 1 Lines 41-44 of Scheetz et al which discloses condensed silica fume as an amorphous silica having spherical, i.e., spheroidal, particles.

In light of the above, it is clear that Kawai et al as evidenced by Anderson, Cornwell, Japs, and Lane anticipates the presently recited claims.

Claim Rejections - 35 USC § 103

45. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

46. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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47. Claims 42 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al (US 5,945,044) in view of Anderson et al (US 5,695,811), Cornwell et al (US 4,310,486), and Japs (US 4,099,376).

The discussion with respect to Kawai et al, Anderson, Cornwall, and Japs as set forth in Paragraph 43 above is incorporated here by reference.

Regarding claims 42 and 52, Kawai et al, Anderson, Cornwall, and Japs disclose all the claim limitations as set forth above. Additionally, Kawai et al discloses that the composition may comprise not only the silica cement discussed above, but other cements such as those based on Portland cement and blast furnace slag (Column 2, Lines 18-24). It is noted that blast furnace slag as disclosed by the reference meets Applicant's definition of "pozzolanic binding agent" disclosed on Page 5 Lines 21-22 of the present Specification.

While the reference fails to exemplify the presently claimed composition nor can the claimed composition be "clearly envisaged" from the reference as required to meet the standard of anticipation (cf. MPEP 2 13 1-03), nevertheless, in light of the overlap between the claimed composition and the composition disclosed by the reference, absent a showing of criticality for the presently claimed composition, it is urged that it would have been within the bounds of routine experimentation, as well as the skill level of one of ordinary skill in the art, to use blast furnace slag which is both disclosed by the reference and encompassed within the scope of the present claims and thereby arrive at the claimed invention.

48. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al (US 5,945,044) in view of Anderson et al (US 5,695,811), Cornwell et al (US 4,310,486), Japs (US 4,099,376), and *Blast Furnace Slag* (see attached pages).

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The discussion with respect to Kawai et al, Anderson, Cornwall, and Japs as set forth in Paragraph 47 above is incorporated here by reference.

Regarding claim 53, the combined disclosures of et al, Anderson, Cornwall and Japs teach all the claim limitations as set forth above. As discussed above, Kawai et al discloses that the composition comprises blast furnace slag. However, the reference does not disclose that the blast furnace slag comprises calcium oxides in the amount of approximately 40 wt. %, silica in the amount of approximately 30 wt %, and alumina in the amount of approximately 10 wt. %.

Blast Furnace Slag discloses that the typical blast furnace slag comprises 34-43 wt. % calcium oxide, 27-38 wt. % silica and 7-12 wt. % alumina (Page 4, Table 3-2, column entitled 1985).

Regarding the amount of calcium oxide, silica, and alumina disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

49. Claims 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al (US 5,945,044) in view of Anderson et al (US 5,695,811), Cornwell et al (US 4,310,486), Japs (US 4,099,376), Symons (US 5,601,919), Klus (2003/0015124), and Lewis (see attached pages of *Hawley's Condensed Chemical Dictionary*).

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The discussion with respect to Kawai et al, Anderson, Cornwall, and Japs as set forth in Paragraph 43 above is incorporated here by reference.

Regarding claim 43, the combined disclosures of Kawai et al, Anderson, Cornwall, and Japs teach all the claim limitations as set forth above. Additionally, Kawai et al discloses other components which maybe added to the compositions including water-proof or water-repellant agents (Column 3, Lines 17-21). However, the reference does not disclose a water-repellent agent in solid form.

Symons discloses a composition comprising hydraulic binders, i.e. Portland cement to which is added waterproofing agents which are added to the composition in order the render the composition hydrophobic (Column 3, Lines 44-56, Column 4, Lines 22-27). The reference discloses polymers in the forms of dispersions, i.e. powder which is added to the hydraulic binder in order to provide toughness, adhesion and resistance to water, i.e. water repellent. (Column 3, Lines 57-60).

Given that both Kawai et al and Symons are drawn to compositions comprising hydraulic binders containing water-proofing agents, and, given that Kawai does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the waterproofing solution, i.e. potassium methyl silicate as taught by Symons, it would therefore have been obvious to one of ordinary skill in the art to include such waterproofing agents in the composition disclosed by Kawai with a reasonable expectation of success.

The combined disclosures of Kawai et al, Anderson, Cornwall, and Japs teach all the claim limitations as set forth above. However, the references do not disclose a powder comprising refractory clay comprising aluminum silicate..

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Klus discloses a compositions comprising ingredients such as hydraulic cements and pozzolanic cements and shrinkage reduction agents such as clays including clays each as fireclay (Page 3 [036]-[0037], [0042]-[0043]). The clays are added to the composition is in order to reduce shrinkage of the composition during application of heat, improved fire resistance and high temperature dimensional stability (Page 3 [0037]).

Although the reference does not disclose fire clay as a refractory clay comprising aluminum silicate. It is the Examiner's position that fireclay is such ass clay. Support for the Examiner's position is found on Page 997 of Lewis which discloses refractory clays including fireclay which comprising aluminum silicates.

Given that both Kawai et al and Klus et al are drawn to compositions comprising hydraulic and pozzolanic cements, and, given that Kawai et al does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the fireclay as taught by Klus, it would therefore have been obvious to one of ordinary skill in the art to include such clays in the composition disclosed by Kawai with a reasonable expectation of success.

Regarding claim 44, the combined disclosures of Kawai et al, Anderson, Cornwall, and Japs teach all the claim limitations as set forth above.

Additionally, Kawai et al discloses that the composition may comprise not only the silica cement discussed above, but other cements such as those based on Portland cement and blast furnace slag (Column 2, Lines 18-24). It is noted that blast furnace slag as disclosed by the reference meets Applicant's definition of "pozzolanic binding agent" disclosed on Page 5 Lines 21-22 of the present Specification.

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Kawai et al discloses other components which maybe added to the compositions including water-proof or water-repellant agents (Column 3, Lines 17-21). However, the reference does not disclose a water-repellent agent in solid form.

Symons discloses a composition comprising hydraulic binders, i.e. Portland cement to which is added waterproofing agents which are added to the composition in order the render the composition hydrophobic (Column 3, Lines 44-56, Column 4, Lines 22-27). The reference discloses polymers in the forms of dispersions, i.e. powder which is added to the hydraulic binder in order to provide toughness, adhesion and resistance to water, i.e. water repellent. (Column 3, Lines 57-60). Further additives include waterproofing agents which are added to the composition in order the render the composition hydrophobic (Column 3, Lines 44-56, Column 4, Lines 22-27).

Given that both Kawai et al and Symons are drawn to compositions comprising hydraulic binders containing water-proofing agents, and, given that Kawai does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the waterproofing solution and water repellants disclosed by Symons, it would therefore have been obvious to one of ordinary skill in the art to include such waterproofing and water repellent agents in the composition disclosed by Kawai with a reasonable expectation of success

Klus discloses a compositions comprising ingredients such as hydraulic cements and pozzolanic cements and shrinkage reduction agents such as clays including clays each as fireclay (Page 3 [036]-[0037], [0042]-[0043]). The clays are added to the composition is in order to reduce shrinkage of the composition during application of heat, improved fire resistance and high

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temperature dimensional stability (Page 3 [0037]). The reference discloses that clays such as fireclays are utilized in amount from about 3.5 to 7.5 wt % of the compositions (Page 4 [0059]).

Although the reference does not disclose fire clay as a refractory clay comprising aluminum silicate. It is the Examiner's position that fireclay is such ass clay. Support for the Examiner's position is found on Page 997 of Lewis which discloses refractory clays including fireclay which comprising aluminum silicates.

Given that both Kawai et al and Klus et al are drawn to compositions comprising hydraulic and pozzolanic cements, and, given that Kawai et al does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the fireclay as taught by Klus, it would therefore have been obvious to one of ordinary skill in the art to include such clays in the composition disclosed by Kawai with a reasonable expectation of success.

50. Claims 46, and 56-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al (US 5,945,044) in view of Anderson et al (US 5,695,811), Cornwell et al (US 4,310,486), Japs (US 4,099,376), Symons (US 5,601,919), and Holbek (US 2005/0016418).

The discussion with respect to Kawai et al, Anderson, Cornwall and Japs as set forth in Paragraph 43 above is incorporated here by reference.

Regarding claims 46 and 56-59, Kawai et al, Anderson, Cornwall, and Japs disclose all the claim limitations as set forth above. Additionally, Kawai et al discloses other components which maybe added to the compositions including water-proof or water-repellant agents (Column 3, Lines 17-21). However, the reference does not disclose a water-proofing agent comprising 1 to 2 wt % of the composition.

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Symons discloses a composition comprising hydraulic binders, i.e. Portland cement to which is added waterproofing agents which are added to the composition in order to render the composition hydrophobic (Column 3, Lines 44-56, Column 4, Lines 22-27). The reference discloses waterproofing agents such as a solution of potassium methyl silicate, known under the tradename BS15, which is added to the hydraulic binder in the amount from 0.05 to 3 wt %. (Column 24 Lines 7-34). It is noted that potassium methyl silicate meets the limitations recited in claim 59. Although the reference does disclose that BS15 is an aqueous solution, as evidenced by Holbek, Page 2 Paragraph [0023], BS-15 is an aqueous solution of potassium methyl silicate.

Given that both Kawai et al and Symons are drawn to compositions comprising hydraulic binders containing water-proofing agents, and, given that Kawai does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the waterproofing solution, i.e. potassium methyl silicate as taught by Symons, it would therefore have been obvious to one of ordinary skill in the art to include such waterproofing agents and amounts thereof in the composition disclosed by Kawai with a reasonable expectation of success.

Conclusion

51. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER C. KOLLIAS whose telephone number is (571)-270-3869. The examiner can normally be reached on Monday-Friday, 8:00 AM -5:00 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. C. K./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796